PrePARED

Predators + Prey Around Renewable Energy Developments

Quarterly Report: Q2 2023
Date: 30/06/2023

Project Overview

Scottish Government Marine Directorate (SGMD) formally known as 'Marine Scotland' (MS) now have a project manager in post.

Delayed tasks from previous quarters are progressing well.

Q2 deliverables have been progressing and all achieved with following exceptions;

- Task 3.1/3.2: Downstream provision for University of Aberdeen predator models delayed due to University of Exeter staff long term leave. Due to staff changes at UoA there has not been an immediate need for this data.
- Task 3.3: Catch and tag gadoid fish in the Moray Firth – these surveys have gone ahead, however, catch rates have been very poor.
- Task 4.1: Stakeholder workshop under review due to other priorities relating to consenting.
- Task 6.2: Scope of this work package under review to maximise relevance to future consenting.

Summary of activities undertaken in Q2 2023

Task 1.1 Broad-scale fish response to OWF in Forth: Broadscale prey fields from acoustic transects delayed from Q1 2023 are progressing and are expected for Q3 (due to 5 months delay in Fisheries Acoustician start date). Prey surfaces, modelled for 8 species, and derived from historic data were made available to project partners to mitigate this delay.

- Grab and Particle Size (PSA) analyses were replaced by a compilation of RoxAnn survey data and historic grab data. Data were compiled and modelled and outputs consisting of layers of hardness, roughness, percentage silt/sand/gravel were produced for the Forth and Tay and extended to the whole area of interest (East coast of Scotland).
- Fisheries acoustic surveys (Forth and Tay and Moray Firth) were designed, documentation made available and reviewed by the developers and the survey executed.
- Surveys were designed according to site restrictions and complied with developers' requests (meetings and email exchanges, direct communication with Marine coordination centres).

Task 1.2 Fine-scale fish response to OWF in Forth: Due to the delay associated with the late start of the Fish Community Ecologist and the Fisheries Acoustician (4 and 5 months respectively), 2022 analyses are not completed yet but have progressed well. Fish distributions modelled from historic data being used to control for the effect of habitat suitability on fish abundance within and outside OWFs. First results have been obtained for flatfish and are underway for gadoids. Stereo Baited Remote Underwater Video (SBRUV) and trap data are also used for the modelling of broadscale fish distribution as these constitute the only source of data for demersal fish within OWFs. Demersal fish abundances obtained from

SBRUV/traps have been mapped and some of the preliminary results presented at the PrePARED Knowledge Exchange Workshop 2023.

Task 2.1 Seabird spatial distribution models in Forth: See report from Task 1.1 on delays to prey data processing. We received historic prey data fields from 1.1 and are currently incorporating these into the modelling frameworks. NDA with EDF/NnG is almost finalised so we can access the seabird tracking data in Q3. We received a 2019 run of a physics-only Firth of Forth Scottish Shelf Model from SGMD and are currently incorporating these covariates into the modelling framework.

Task 2.2 Seabird movement models in Forth: No targets this quarter

Task 2.3 Seabird displacement rates in Forth: No targets this quarter.

Task 3.1 Large-scale fish distribution in Moray: Fisheries acoustic survey completed, along with associated trawl effort to validate acoustic data. Fish samples collected for SMRU Consulting. Video data now watched and digitised, and analysis is well progressed. A member of the University of Exeter project team has been on long-term leave and so discussions on downstream provision have been delayed. Users of the data at University of Aberdeen are also changing and so immediate need for data has not posed a challenge.

Task 3.2 Fine-scale fish distribution in Moray (reef effects): Video data now watched and digitised, and analysis is well progressed. A University of Exeter staff member has been on long-term leave and so discussions on downstream provision have been delayed. Users of the data at University of Aberdeen are also changing and so immediate need for data has not posed a challenge.

Task 3.3 Fish acoustic telemetry in Moray: Analysis of ping data is ongoing. The network of fish tag receivers has been activated on the European Tracking Network, the tagged animals remain under

moratorium and so data access limited to project staff only. Some receivers from initial deployment last year remain on seabed due to technical reasons and need to retrieve using an ROV. A second trip to catch and tag fish went ahead but catch rates were very poor. Still experiencing challenges with two main capture routines. Further work being undertaken by SGMD to limit the problems.

Task 4.1 Drivers of broadscale marine mammal distribution in Moray: Requirement for stakeholder workshop under review at this stage due to the need for key stakeholders to prioritise more urgent tasks related to consenting. Analyses under this task have focussed on assessment of the value of using SGMD sandeels as an explanatory variable in models of harbour porpoise and harbour seal distribution and foraging activity.

Task 4.2 Finescale marine mammal distribution in response to OWF and prey fields in Moray: Preliminary results arising from the data collected in 2022 were presented to key Moray Firth stakeholders through the MFRAG-MM. Following this, plans for the 2023 construction PAM array were presented to the same meeting to finalise agreement on the design from key stakeholders (as required for industry-funded data collection under consent conditions).

Task 4.3 Dose response curves in Moray: Plans for the 2023 construction PAM array were presented to key Moray Firth stakeholders through the MFRAG-MM on 31/03/23 to agree the final design (see Task 4.2 above). An application for Consent for the survey works was submitted to the Crown Estate Scotland and a draft consent has been received conditional on securing 3rd party consents and notifications, which is in progress. Consumables and equipment for the PAM devices and moorings, including acoustic releases, were ordered, and received. Acoustic releases have been set up, and assembly of the moorings has started in preparation for deployment in Q3.

Task 4.4 Fish nutritional value: In Q2 of 2023, we received the PrePARED 2023 samples from the Moray Firth surveys. Once the Forth and Tay surveys are completed on the 5th of July, we will collect the samples from those surveys as well. Currently, we are analysing the PrePARED 2022 samples, with the following species having been processed: mackerel, bull-rout, viviparous eelpout, lemon sole, long-rough dab, whiting, and flounder. Our analysis of the PrePARED 2022 samples will continue throughout Q3.

Task 5.1 Generalities in fish response to OWF: No targets this quarter

Task 5.2 Generalities in harbour porpoise response to OWF: In Q2 of 2023, we completed the analyses of the effects of array designs on porpoise dose response studies to pile driving using acoustic loggers. We had meetings with the University of St Andrews and University of Aberdeen teams to present the results and discuss their implications for future studies. Preparation of a draft manuscript will continue throughout Q3.

Task 6.1 Minimum data requirements for seabird distribution and movement models: No targets this quarter

Task 6.2 Minimum data requirements for marine mammal distribution models: Scope of this work package under review to maximise relevance to future consenting.

Task 6.3 UK EEZ marine habitats similarity assessment for OWF sites: No targets this quarter

Task 6.4 Survey design for predator-prey studies: Work has continued engaging with the University of Exeter team to align with Task 6.3. Otherwise, collation of wind farm data for English and Welsh OWF has continued.

Task 7.1 IPCoD and DEPONS integration of new data and testing: Discussion and collaboration are ongoing with the University of Aberdeen and Aarhus University teams.

Task 7.2 Adding biological realism to SeabORD and testing: Our new PrePARED postdoc, Chris Pollock, started at UKCEH on March 28th 2023. He has been working to understand and implement the individual-based model, SeabORD over the last few months. He is now working on this task and is currently assessing how the sandeel maps can be used within SeabORD, and the required changes necessary for this implementation. He is also working with SGMD to consider how the new prey maps for the Forth-Tay, developed by SGMD, may be used within SeabORD. Chris also attended a training course in statistical modelling in Lancaster to develop his modelling skills, and will implement this training in a PrePARED analysis considering how non-breeding season attendance to colonies during the autumn and winter may affect exposure of seabirds to offshore windfarms.

Task 7.3 SeabORD for the FFC SPA: No targets this quarter

Task 7.4 Integration of PrePARED findings for harbour porpoise CIA: Data collation of wind farm data for UK OWF has continued to support CIA assessments. Additionally, discussions of the elements of the CIA which can be considered here and how to achieve project objectives have been discussed among the project team and with developer representatives.

Task 7.5 Integration of PrePARED findings for seabird CIA: No targets this quarter

Task 8.1 Stakeholder and network analysis: Stakeholder and Network analysis contract has been allocated to Fast Track Impact Ltd. after a successful bid and evaluation. A kick off meeting was conducted on 22 June 2023 and contract is due to be completed by 31 July 2023.

Task 8.2 Communications Plan: A draft communications plan has been produced and is expected to be updated accordingly by the results of the stakeholder and network analysis. Once finalised this will be distributed to all project partners, OWEC Communications Team and SGMD Communication team.

Task 9.1 Annual knowledge exchange workshops: Initial discussions regarding the planning for this event occurred at the Management Group on 29 June 2023.

Task 9.2 Dissemination of project findings: Project Manager, Lauren Donachie, hired during Quarter 2 who can support with dissemination of project findings.

Task 9.3 PrePARED project scientific symposium: No targets this quarter – for last year of project

Task 9.4 Website and social media: Project website continues to be updated and there are plans to begin a monthly blog from July 2023. We have connected with the SGMD communications team to discuss how we can best work together moving forward and there will be further movement regarding this once the communications plan is finalised.

Summary of activities undertaken in Q3 2023

Task 1.1: 1) Conduct fisheries acoustic survey/ seabird at sea survey: (mid July). 2) Initiate laboratory work (otolith analyses, PSA analyses (subject to laboratory availability)). 3) Initiate post processing of acoustic signal and trawl data analyses.

Task 1.2: 1) Conduct BRUV/Fish trap surveys in the Firth of Forth. 2) Design surveys considering development site conditions. 3) Completion of surveys. 4) Initiate analyses of SBRUV data. 5) Initiate grab data analyses (PSA).

Task 2.1: Integrate prey data into distribution models.

Task 2.2 and 2.3: No target for Q3

Task 3.1: 1) Laboratory analyses of grab samples (subject to lab availability). 2) Post-processing of fisheries acoustic and trawl data. Delayed work on downstream provision for University of Aberdeen predator models.

Task 3.2: 1) Unbaited camera surveys in Moray Firth. 2) Design surveys considering development site conditions. 3) Conduct unbaited camera surveys. Delayed work on downstream provision for University of Aberdeen predator models.

Task 3.3: 1) Service acoustic array and download ping data in the Moray Firth: (a) Completion of annual data download. (b) Completion of annual tagging

Task 4.1: Completion of distribution modelling and draft report. Stakeholder workshop – outcome of Q2 review.

Task 4.2: Delivery of draft report.

Task 4.3: Deploy the construction PAM array.

Task 4.4: Initial processing of any available samples.

Task 5.1: No target for Q3

Task 5.2: Convene quarterly meetings to discuss progress on data collection and coincidental analyses.

Task 6.1: No target for Q3

Task 6.2: Complete collation of digital aerial survey datasets for English waters. Outcome of scope review from Q2.

Task 6.3: No target for Q3

Task 6.4: Collate and review data from English and Welsh OWF, other marine mammal monitoring projects.

Task 7.1: Integration of project learning into latest DEPONS and iPCoD.

Task 7.2: Development of initial model parameterisation to work with sandeel suitability estimates.

Task 7.3: No target for Q3

Task 7.4: Convene quarterly meetings to understand progress on CIA components (which PrePARED will update and improve upon)

Task 7.5: No target for Q3

Task 8.1: Monitor contractor progress

Task 8.2: Implement Comms Plan

Task 9.1: Begin planning 2023 KEM.

Task 9.2: Support for technical and non-technical dissemination of project findings

Task 9.3: No target until last year of project

Task 9.4: Maintain project website and social media comms